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Pesticide Fact Sheet Number 85: Hybrex

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15. Supplementary Notes

16. Abstract (Limit: 200 words)

This document contains up-to-date chemical information, including a summary of the Agency's regulatory position and rationale, on a specific pesticide or group of pesticides. A Fact Sheet is issued after one of the following actions has occurred.

1. Issuance or reissuance of a registration standard,
2. Issuance of each special review document,
3. Registration of a significantly changed use pattern,
4. Registration of a new chemical, or
5. An immediate need for information to resolve controversial issues relating to a specific chemical or use pattern.

17. Document Analysis a. Descriptors
Pesticides, regulations, Chemical Information Fact Sheet, Use Patterns, Science Findings

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

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Office of Pesticide Programs (TS-766C)
Washington, DC 20460

EPA

Pesticide Fact Sheet

Name of Chemical: Hybrex
Reason for Issuance: New Chemical Registration
Date Issued: April 1986
Fact Sheet Number: 85

1. Description of chemical

Generic name: Potassium 1-(4-chlorophenyl)-1,4-dihydro-6-methyl-4-oxopyridazine-3-carboxylate

Common name: (ISO) Fenridazone-potassium

Trade name: Hybrex

EPA Shaughnessy code: 119001

Year of initial registration: 1986

Pesticide type: Hybridizing agent

Chemical family: dihydro-oxopridizine

U.S. and foreign producers: Rohm and Haas

2. Use patterns and formulations

Application sites: wheat hybridizing agent (a chemical which allows production of hybrid plants; in this particular case, through allowing easier cross-pollination of normally self-pollinating species of plant such as wheat).

Hybrex® detrimentally affects the pollen produced by treated wheat plants so that they cannot be self-pollinated, but must rely instead on a different untreated variety of wheat to supply the pollen. The offspring is a hybrid wheat variety.

Method of Application: Apply between the initiation of jointing and flag leaf tip emergence stages of growth. Apply no later than 50 days before harvest with a ground, rig, as a foliar spray in enough water to cover foliage.

Application Rates: Use 2 to 10 pints (0.5 to 2.5 lb active ingredient) per acre with up to 4 quarts of surfactant per 100 gallons of spray mixture.

Types of Formulations: Liquid concentrate end use product 21.97% active ingredient.

Usual Carrier: Water, with surfactant.

3. SCIENCE FINDINGS

Summary Science statement: Hybrex has been found to be acceptable for the proposed use and all data requirements have been met. It is relatively non-toxic by the oral, dermal an inhalation routes, mildly irritating to the skin and causes corneal opacity at 24 hours when exposed to the eyes. Hazard to nontarget organisms is considered to be minimal.

Chemical Characteristics:

Physical State:	Aqueous solution
Color:	Deep red to red/brown
Odor:	Slight xylene odor
Boiling Point:	100.2 °C
Molecular Weight:	302.76

Solubility:

Solvent	Solubility a/
Distilled water, pH 5.0	1.97 ± 0.10 g/100 ml
Distilled water, pH 6.9b/	1.444 ± 0.4 g/100 ml
Methanol	7.02 ± 0.05 g/100 ml
Absolute ethanol	0.247 ± 0.010 g/100 ml
Ethyl cellosolve	1.892 ± .002 g/100 ml
Dimethyl sulfoxide	0.670 ± .039 g/100 ml
Acetonitrile	200 ± 90 mg/kg
Mixed xylenes	< 60 mg/kg

a/ Mean value ± standard deviation of duplicate determinations.

b/ This mixture was quite viscous: the solubility would be expected to be still higher at pH 9.

Unusual Handling Characteristics:

No special handling needed.

Toxicology Characteristics:

Acute effects: Hybrex is relatively non-toxic by oral, dermal and inhalation routes, mildly irritating to the skin and causes corneal opacity at 24 hours when exposed to the eyes. Acute test results indicate Toxicity Categories II, III, and IV[1/] as follows:

Acute oral toxicity (mouse)
Greater than 500 ppm (75 mg/kg/day)
Toxicity Category IV

Acute oral toxicity (rat)
Greater than 500 ppm (25 mg/kg/day)
Toxicity Category IV

Acute oral toxicity (mouse)
Greater than 2000 ppm (300 mg/kg/day)
Toxicity Category IV

Acute dermal toxicity (rabbit)
Greater than 5 g/kg
Toxicity Category III

Acute inhalation toxicity (rat)
Greater than 20.2 mg/l
Toxicity Category IV

Primary eye irritation (rabbit)
Corneal opacity at 24 hours
Toxicity Category II

Primary dermal irritation (rabbit)
Mildly irritating
Toxicity Category IV

1/ Precautionary labeling for: 1/ Toxicity Category II- Causes eye irritation. Do not get in eyes, on skin, or clothing. Harmful if swallowed. (appropriate first aid statement required); Toxicity Category III- Harmful if swallowed. Avoid contact with skin eyes or clothing. In case of contact immediately flush eyes or skin with plenty of water. Get medical attention if irritation persists; and Toxicity Category IV- No precautions are required.

Subchronic effects: Tests indicate systemic effects at the lowest dose tested (LDT).

14-Day dose finding study: (rat)	No-observed-effect level (NOEL) 6250 ppm (312.5 mg/kg/day)
90-Day feeding study (rat)	NOEL less than 500 ppm (LDT) (25 mg/kg/day)

Chronic effects: Tests indicate no oncogenic or teratogenic potential and no reproductive toxicity, and only weak mutagenicity in mouse lymphoma cells with three negative mutagenicity studies reported.

1-year dietary toxicity study (beagle dogs)	:	NOEL (62.5 mg/kg/day)
2-year rat feeding study		NOEL 300 ppm (15 mg/kg/day) No oncogenic effects observed.
18-month rat feeding study:		NOEL 2,000 ppm (300 mg/kg/day) No oncogenic effects observed.
3-generation reproduction study (rat)	:	NOEL 100 ppm, (5 mg/kg/day) for systemic effects, (45 mg/kg/day) for reproductive effects.
Teratology (rabbit)	:	NOEL (1,000 mg/kg/day), fetal toxicity NOEL (100 mg/kg day), maternal toxicity NOEL (100 mg/kg/day).
Teratology (rat)	:	NOEL 10,000 ppm (500 mg/kg/day). fetal toxicity NOEL 30,000 ppm (1,500 mg/kg/day), teratogenic NOEL 30,000 ppm (1,500 mg/kg/day).

Mutagenicity	Ames test	:	Negative
Mutagenicity	Cytogenic	:	Negative
Mutagenicity	Mouse Lymphoma cells:		Weakly mutagenic at 1250 g/ml under both activated and non-activated test conditions.
Mutagenicity	<u>in vitro</u> transformation:		Negative

The Acceptable Daily Intake (ADI)
NOEL of (15.0 mg/kg/day)

Major Routes of Exposure: Dermal, inhalation

Physiological and Biochemical Behavoiral Characteristics:

Foliar Absorption: Absorption occurs through the foliage.

Translocation: The material is translocated to the fruiting parts from the foliage.

Mechanism of Action: Hybrex® detrimentally affects the pollen produced by treated wheat plants so that they cannot be self-pollinated but must rely instead on a different untreated variety of wheat to supply the pollen. The offspring is a hybrid wheat variety.

Persistence: Hybrex is not persistent in plants or animals.

Metabolism in plants and animals: The nature of the residues in plants and animals is adequately understood for the use of hybrex on wheat. The parent compound and its decarboxylated metabolite (2% plants, 1% or less in animals) are the residues of concern. The residue analytical method is adequate for the determination of residues in wheat and for enforcement purposes.

Environmental Characteristics: Hybrex is stable to hydrolysis at pH 5.0 and 6.9. It is soluble in distilled water at 1.44 to 1.97 g/100 ml.

Absorption and leaching in basic soil types: Hybrex is strongly adsorbed, and not very mobile in soil.

Microbial breakdown: Hybrex is decarboxilated slightly, however the parent compound stays relatively intact and is strongly adsorbed to soil particles.

Loss from photodecomposition and volatilization: Photodecomposition is very slight and volatilization does not occur.

Resultant average persistence: Hybrex should not persist beyond 52 days.

Ecological Characteristics: The following test results indicate that Hybrex is practically nontoxic to avian species, finfish, aquatic invertebrates and honeybees.

Hazards to Birds:

Avian acute oral toxicity: Greater than 5,000 ppm. (mallard duck and bobwhite quail)

Avian dietary toxicity: Greater than 5,390 ppm. (mallard duck and bobwhite quail)

Hazards to Fish:

Fish acute toxicity:

Bluegill sunfish	141.3 ppm
Rainbow trout	266.5 ppm
Fathead minnow	43.7 ppm

(fathead minnows were very young)

Aquatic invertebrate toxicity:

Daphnia magna	188.0 ppm

Honeybees:

Nontoxic to honeybees.

Tolerance Assessment:

List of Crops and Tolerances

Commodity	Parts per million
Wheat grain	40.0
Wheat straw	25.0
Meat and meat byproducts (except kidney and liver) of cattle, goats, hogs, horses, and sheep.	0.05
Fat of cattle, goats, hogs, horses, and sheep.	0.05
Kidney and liver of cattle, goats, hogs, horses, and sheep.	1.00

Fat, meat, and meat byproducts of poultry.	0.30
Eggs	0.05
Milk	0.05

4. Summary of Regulatory Position and Rationale:

Position: The agency has accepted the use of this pesticide for the production of hybrid wheat seed.

Rationale: The agency has reviewed the data submitted and found these data to be adequate for the proposed use of this pesticide. The proposed use of this pesticide is not expected to result in any adverse effects to humans or the environment and will fill a need for producing large quantities of hybrid wheat seed.

Use Restrictions: For use by Rohm and Haas company or or under the direct supervision of their representative only.

Unique label statements: See use restrictions above.

5. Summary of major data gaps:

None.

6. Contact Person at EPA

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DISCLAIMER:

The information presented in this Chemical Information Fact Sheet is for informational purposes only and may not be used to fulfill data requirements for pesticide registration and reregistration.

NO ERRORS THIS RUN

IAAF20J RUN STATISTICS DATE: 12/05/86

LOGICAL RECORDS INPUT	85
PHYSICAL RECORDS INPUT	151
LOGICAL RECORDS OUTPUT	85
PHYSICAL RECORDS OUTPUT	151
RECS CORRECT ON INPUT	85